

WHAT IS CLAIMED IS

1. A speech synthesis apparatus having a database for managing phonemic piece data, comprising:

generating means for generating a second phoneme in consideration of a phonemic context for a first phoneme as a search target;

search means for searching said database for a phonemic piece data corresponding to the second phoneme;

re-search means for generating a third phoneme by changing the phonemic context on the basis of the search result obtained by said search means, and re-searching said database for phonemic piece data corresponding to the third phoneme; and

registration means for registering the search result obtained by said search means or said re-search means in a table in correspondence with the second or third phoneme.

2. The apparatus according to claim 1, wherein said registration means comprises

calculation means for calculating an average fundamental frequency of phonemic piece data searched out by said search means or said re-search means, and

sorting means for sorting the searched phonemic piece data group on the basis of the average fundamental frequency calculated by said calculation means, and

registers the phonemic piece data group and the second or third phoneme in correspondence with each other according

to an order in which the phonemic piece data group is sorted by said sorting means.

3. The apparatus according to claim 1, wherein the second phoneme is a triphone obtained in consideration of phonemic contexts of right and left phonemes of the first phoneme.

4. The apparatus according to claim 1, wherein the third phoneme is a phoneme obtained in consideration of at least one of phonemic contexts of right and left phonemes of the first phoneme.

5. The apparatus according to claim 1, wherein the third phoneme is a phoneme obtained in consideration of a left phonemic context of the first phoneme when the first phoneme is a vowel, and a right phonemic context of the first phoneme when the first phoneme is a consonant.

6. The apparatus according to claim 2, wherein said registration means further comprises quantization means for quantizing an average fundamental frequency of the searched phonemic piece data.

7. The apparatus according to claim 6, wherein said calculation means interpolates a frequency, of average fundamental frequencies of phonemic piece data groups quantized by said quantization means, for which no corresponding phonemic data is present by using an average fundamental frequency which is adjacent to the frequency and for which corresponding phonemic piece data is present.

8. A speech synthesis apparatus for performing speech

synthesis by using phonemic piece data managed by a database,
comprising:

storage means for storing a table for managing position
information indicating a position of phonemic piece data in
5 the database in correspondence with a phoneme obtained in
consideration of a phonemic context made to correspond to
the phonemic piece data;

calculation means for acquiring phonemic context
information of a phoneme as a synthesis target and
10 fundamental frequencies corresponding thereto and
calculating an average of acquired fundamental frequencies;

search means for searching a phoneme group
corresponding to the phonemic context information from the
table;

15 acquisition means for acquiring, from the table,
position information of phonemic piece data corresponding
to a predetermined phoneme of the phoneme group searched out
by said search means, on the basis of the average of
fundamental frequencies calculated by said calculation
20 means; and

changing means for acquiring phonemic piece data
indicated by the position information, acquired by said
acquisition means from the database, and changing a prosody
of the acquired phonemic piece data.

25 9. The apparatus according to claim 8, wherein said
changing means changes the prosody by using a pitch

synchronous waveform overlap adding method.

10 The apparatus according to claim 8, wherein when a
fundamental frequency of a phoneme obtained in consideration
of the phonemic context is quantized, said storage means
5 manages the quantized fundamental frequency in the table in
correspondence with position information indicating a
position in the database at which phonemic piece data
corresponding to the phoneme is present.

10 11. The apparatus according to claim 8, wherein when a
fundamental frequency of a phoneme obtained in consideration
of the phonemic context is quantized, said calculation means
acquires phonemic context information of a phoneme as a
synthesis target, and calculates an average of quantized
fundamental frequencies of the phoneme group.

15 12. A control method for a speech synthesis apparatus
having a database for managing phonemic piece data,
comprising:

a generating step of generating a second phoneme in
consideration of a phonemic context for a first phoneme as
20 a search target;

a search step of searching said database for a phonemic
piece data corresponding to the second phoneme;

a re-search step of generating a third phoneme by
changing the phonemic context on the basis of the search
25 result obtained in said search step, and re-searching said
database for phonemic piece data corresponding to the third

phoneme; and

a registration step of registering the search result obtained in said search step or said re-search step in a table in correspondence with the second or third phoneme.

5 13. The method according to claim 12, wherein said registration step comprises

a calculation step of calculating an average fundamental frequency of phonemic piece data searched out in said search step or said re-search step, and

10 a sorting step of sorting the searched phonemic piece data group on the basis of the average fundamental frequency calculated in said calculation step, and

15 registering the phonemic piece data group and the second or third phoneme in correspondence with each other according to an order in which the phonemic piece data group is sorted in said sorting step.

14. The method according to claim 12, wherein the second phoneme is a triphone obtained in consideration of phonemic contexts of right and left phonemes of the first phoneme.

20 15. The method according to claim 12, wherein the third phoneme is a phoneme obtained in consideration of at least one of phonemic contexts of right and left phonemes of the first phoneme.

25 16. The method according to claim 12, wherein the third phoneme is a phoneme obtained in consideration of a left phonemic context of the first phoneme when the first phoneme

is a vowel, and a right phonemic context of the first phoneme when the first phoneme is a consonant.

17. The method according to claim 13, wherein said registration step further comprises a quantization step of
5 quantizing an average fundamental frequency of the searched phonemic piece data.

18. The method according to claim 17, wherein said calculation step comprises interpolating a frequency, of
10 average fundamental frequencies of phonemic piece data groups quantized in said quantization step, for which no corresponding phonemic data is present by using an average fundamental frequency which is adjacent to the frequency and for which corresponding phonemic piece data is present.

19. A control method for a speech synthesis apparatus for
15 performing speech synthesis by using phonemic piece data managed by a database, comprising:

20 a storage step of storing a table for managing position information indicating a position of phonemic piece data in the database in correspondence with a phoneme obtained in consideration of a phonemic context made to correspond to the phonemic piece data;

25 a calculation step of acquiring phonemic context information of a phoneme as a synthesis target and fundamental frequencies corresponding thereto and calculating an average of acquired fundamental frequencies;

a search step of searching a phoneme group

corresponding to the phonemic context information from the table;

an acquisition step of acquiring, from the table, position information of phonemic piece data corresponding to a predetermined phoneme of the phoneme group searched out in the search step, on the basis of the average of fundamental frequencies calculated in said calculation step; and

a changing step of acquiring phonemic piece data indicated by the position information acquired in said acquisition step from the database, and changing a prosody of the acquired phonemic piece data.

20. The method according to claim 19, wherein said changing step comprises changing the prosody by using a pitch synchronous waveform overlap adding method.

21. The method according to claim 19, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said storage step comprises managing the quantized fundamental frequency in the table in correspondence with position information indicating a position in the database at which phonemic piece data corresponding to the phoneme is present.

22. The method according to claim 19, wherein when a fundamental frequency of a phoneme obtained in consideration of the phonemic context is quantized, said calculation step comprises acquiring phonemic context information of a phoneme as a synthesis target, and calculating an average

of quantized fundamental frequencies of the phoneme.

23. A computer-readable memory storing program codes for controlling a speech synthesis apparatus having a database for managing phonemic piece data, comprising:

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5 a program code for the generating step of generating a second phoneme in consideration of a phonemic context for a first phoneme as a search target;

a program code for the search step of searching said database for a phonemic piece data corresponding to the
10 second phoneme;

a program code for the re-search step of generating a third phoneme by changing the phonemic context on the basis of the search result obtained in the search step, and re-searching said database for phonemic piece data
15 corresponding to the third phoneme; and

a program code for the registration step of registering the search result obtained in the search step or the re-search step in a table in correspondence with the second or third phoneme.

20 24. A computer-readable memory storing program codes for controlling a speech synthesis apparatus for performing speech synthesis by using phonemic piece data managed by a database, comprising:

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25 a program code for the storage step of storing a table for managing position information indicating a position of phonemic piece data in the database in correspondence with

a phoneme obtained in consideration of a phonemic context made to correspond to the phonemic piece data;

5 a program code for the calculation step of acquiring phonemic context information of a phoneme as a synthesis target and fundamental frequencies corresponding thereto and calculating an average of acquired fundamental frequencies;

10 a program code for the search step of searching a phoneme group corresponding to the phonemic context information from the table;

15 a program code for the acquisition step of acquiring, from the table, position information of phonemic piece data corresponding to a predetermined phoneme of the phoneme group searched out in the search step, on the basis of the average of fundamental frequencies calculated in the calculation step; and

a program code for the changing step of acquiring phonemic piece data indicated by the position information acquired in the acquisition step from the database, and changing a prosody of the acquired phonemic piece data.